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APPLICANT : RES DEV CORP OF JAPAN;

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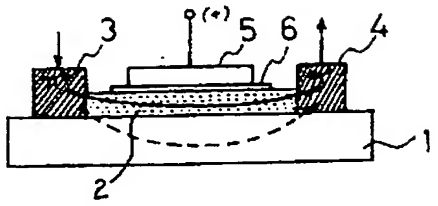
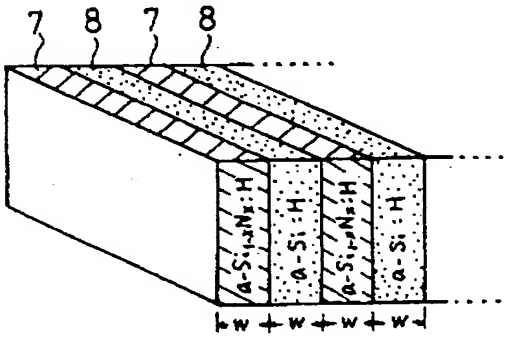
TITLE : FIELD EFFECT TRANSISTOR HAVING CHANNEL PART OF SUPERLATTICE CONSTRUCTION





ABSTRACT : PURPOSE: To obtain a stable and high-speed operable field effect transistor by employing a superlattice construction formed by laminating semiconductor thin films of two kinds of semiconductors having different forbidden bands alternately in channel parts.

CONSTITUTION: A hetero junction superlattice construction formed by laminating very thin films of two kinds of semiconductors having different forbidden bands alternately is employed in channel parts. The said hetero junction superlattice construction is formed by alternately laminating super thin layers of crystals Si and $Si_{1-x}Gex$, non-crystalline Si and $Si_{1-x}Nx$, non-crystalline Si and $Si_{1-x}Cx$ or the like. For example, a non-crystalline a-$Si_{1-x}Nx$:H layer 7 containing hydrogen and a non-crystalline a-Si:H layer 8 are alternately laminated on a semiconductor bulk layer 1. With the thickness of each layer W selected in the range of 30~200Å, an active layer 2 of a heterojunction superlattice construction of which channels are formed during operation is rovided and a source electrode 3, a drain elecerode 4, a gate electrode 5 and a gate insulating film 6 of SiO_2, Si_3N_4 or the like are provided too, thereby to produce a thin film field effect transistor.